

Name: _____

Section: _____

Lab #2 – Delay, Loss and Throughput

IC 322 – Computer Networks

Week 2

This lab is to be completed individually. Collaborative conversations with regard to syntax, strategies and methods for accomplishing the goal of the lab are encouraged; however design and implementation must be the work of the individual student that is handing in the final product.

The lab is due at the beginning of next week's first class . You may wish to review Section 1.4 in your textbook before completing this lab.

Transmission vs. Propagation Delay

This portion of the lab uses an applet from the publisher website here:

http://wps.pearsoned.com/ecs_kurose_compnetw_6/216/55463/14198700.cw/index.html

- Click on Applets
- Click on “Transmission versus Propagation Delay Applet”

1) Among the rates, link lengths and packet sizes available, find one combination where the sender finishes transmitting before the first bit of the data reaches the receiver.

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2) In this configuration, which is longer, transmission delay, or propagation delay?

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3) Now find a configuration for which the first bit of the packet reaches the receiver before the sender finishes transmitting.

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4) In this configuration, which is longer, transmission delay, or propagation delay?

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5) Which parameter(s) influence transmission delay?

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6) Which parameter(s) influence propagation delay?

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Queuing and Loss

This portion of the lab uses an applet from the publisher website here:

http://wps.pearsoned.com/ecs_kurose_compnetw_6/216/55463/14198700.cw/index.html

- Click on Applets
- Click on “Queuing and Loss Applet”

7) What are the maximum emission rate and the minimum transmission rate that can be set using this applet?

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8) With those rates, what is the traffic intensity?

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9) Run the applet with these rates and determine how long it takes for packet loss to occur.

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10) Run the experiment a second time. Do you get the same result? Why or why not?

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Programming - Modifying Java Applets

“An applet is a program written in the Java programming language that can be included in an HTML page, much in the same way an image is included in a page. When you use a Java technology-enabled browser to view a page that contains an applet, the applet's code is transferred to your system and executed by the browser's Java Virtual Machine (JVM).”

Retrieved from <http://java.sun.com/applets/> 29Aug2007

In this portion of the lab, we will modify the applets explored above.

- Open NetBeans and open a new project.
- Select the General project category and the Java Class Library under Projects.
- Under project name, type LineSimApplet.
- Change the project location to IC322/Lab2/Part 1 on your X drive.
- Click Finish.
- Right click the LineSimApplet project node in the Projects window and select New File/Folder.
- Under Categories, select Java Classes. Under File Types, select Applet.
- Click Next.
- Under Class Name, type LineSimApplet. Under Package, type linesim.
- Click Finish. The IDE creates the applet source file in the specified package. The default applet source file opens in the source editor.
- We need to get a copy of the source code for the first applet we used earlier:
 1. Surf to the publisher's resource page in your browser:
http://wps.pearsoned.com/ecs_kurose_compnetw_6/216/55463/14198700.cw/index.html
 2. Click on Applets
 3. Click on "Transmission versus Propagation Delay Applet"
 4. Click on "View the source code"
 5. Press "Ctrl-a" to select all of the source code
 6. Press "Ctrl-c" to copy it to the buffer
 7. Paste that code over the existing default code in NetBeans
- Save the project.
- Right click the LineSimApplet.java file node and compile and run the project. The applet window should pop up and run.

Now, modify the applet code to add options for: a 500km link length, a 2 Mbps rate and a 250 Byte packet size.

11) Run your modified applet using these new options. What is the total delay?

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Follow the same steps to download QueueSimApplet.java from the course web page and open it for modification in NetBeans (Use Lab 2/Part 2 as your project location). This is the source code for the Queuing and Loss applet. Modify the applet so that each time you reset and restart the simulation, it will run faster.

12) At what point is the simulation "too fast"?

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13) If these two applets were written by programmers working for you, what constructive criticism would you give regarding their programming style?

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14) Print your modified source code for QueueSim.java and LineSimApplet.java and attach it to this lab. Circle the areas of code that you modified.